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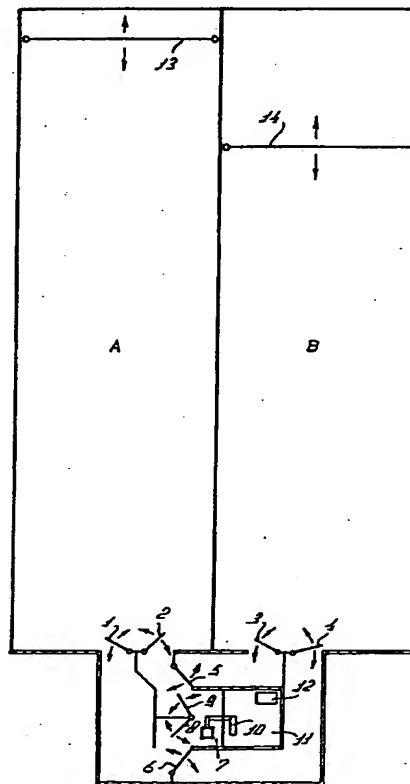
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(54) **A method of milking animals**

(57) In a method of milking animals in a milk box in which a milking robot is arranged, a system of fences, gates, doors, or similar means is set up in such a way that from a first point of time (t1) animals can go freely from a first area (A) to the milk box in order to be milked there and are guided back from there to the said area (A). Afterwards, from a second point of time (t2), the animals can go freely from the first area (A) to the milk box in order to be milked there and are guided from there to a second area (B). Then, the animals still being present in the first area (A) at a third point of time (t3) are driven to the milk box in order to be milked there and are guided from there to the second area (B). After that, this procedure takes place in the opposite direction, whereafter the animals will finally all be again in the first area (A).



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Description

The present invention relates to a method of milking animals, such as cows, in a milk box in which a milking robot is arranged. It is known that, when using a milking robot, it is possible to train the animals in going, of their own free will, in time to the milk box in order to be milked there. In practice, however, this appears not always to apply for all the animals. There are animals letting pass too much time prior to going to the milk box or not even being willing to go there at all. Then, the farmer has to separate these animals from the herd and to drive them to the milking robot. In particular when all the animals are grazing in the field, this might be a difficult job.

Therefore, the invention aims at providing a method of milking animals obviating this drawback for the farmer to a considerable extent. For that purpose, the method according to the invention is characterized in that a system of fences, gates, doors, or similar means is set up in such a way that from a first point of time (t1) animals can go freely from a first area (A) to the milk box in order to be milked and be guided back from there to the said area (A), that afterwards from a second point of time (t2) animals can go freely from the first area (A) to the milk box in order to be milked there and be guided from there to a second area (B) and that afterwards animals still being present in the first area (A) at a third point of time (t3) are driven to the milk box in order to be milked there and are guided from there to the second area (B). Only the animals still being present in the first area (A) at the third point of time (t3) have to be driven to the milk box; these animals do not need to be separated from the grazing herd, because the animals that have been milked are already in the second area (B). The procedure proposed here might be connected with a procedure in the opposite direction; this implies that the invention then also relates to a method characterized in that the system of fences, gates, doors, or similar means is set up in such a way that, from the (fourth) point of time (t4) when the last animal has entered the milk box from the first area (A), animals from the second area (B) can go freely to the milk box in order to be milked there and be guided back from there to the said area (B), that afterwards from a fifth point of time (t5) animals from the second area (B) can go freely to the milk box in order to be milked there and be guided from there to the first area (A) and that then animals still being present in the second area (B) at a sixth point of time (t6) are driven to the milk box in order to be milked there and are guided from there to the first area (A). In this way, the situation at the first point of time has been reached when the latter animals have been milked. The cycle from the first point of time (t1) until the next first point of time (t7) preferably corresponds to approximately 24 hours. This implies that the animals can regularly be driven from the first area (A), or the second area (B) to the milk box.

As, due to the availability of the milking robot in the milk box, the procedure will pass off entirely automati-

cally, also the system of fences, gates, doors, or similar means will be computer-controlled. This is of special advantage if the computer-controlled system will comprise a milking robot.

As mentioned, a number of animals will have to be driven to the milk box. Although this driving can be done by the farmer, the animals should preferably be driven to the milk box by means of movable fencing means in the relevant areas. These movable fencing means will preferably be computer-controlled as well.

The present invention further relates to a construction for milking animals, such as cows, comprising a milk box (7) with a milking robot (10), a computer (12), two separate areas (A, B) and a system of computer controlled fences, gates, doors, or similar means (1 - 6, 8, 9) via which both areas (A, B) can communicate with the milk box (7), in which construction the computer is programmed in such a way that the method according to any one of the claims 1 - 6 can be applied.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawing, in which the arrangement of a milking robot relative to a couple of areas A and B is shown schematically.

Both areas A and B may be a part of an open loose house in which cows can walk freely. Areas A and B might be a part of a meadow or of another place where cows might dwell. Via a system of doors 1 to 6, both areas communicate with a milk box 7 having an entrance door 8 and an exit door 9. In the milk box there is arranged a milking robot 10. In the area 11 being adjacent to the milk box 7 there is arranged a computer 12 for the purpose of controlling the milking robot 10, the doors 1 to 6, 8 and 9 and further all the operations required for automatically milking. In the areas A and B there are provided movable fenceings 13 and 14. These fenceings, that may be constituted e.g. by a live wire, can be moved in the way shown in the drawing from the top to the bottom of the page and in the opposite direction. In particular, the two movable fenceings 13 and 14 may be fixed at both their ends to a construction supported by wheels, said construction being adapted to move through the two areas under control of the computer 12. By moving the fenceings 13 and 14, the animals being present in these areas can be driven in the direction of the milk box 7. In case it is difficult to provide such movable fenceings 13 and 14, it will of course be possible for the farmer to drive the animals himself in the direction of the milk box 7. By controlling the doors 1 to 6 in a proper way, the driving of animals to be effected by the farmer will be facilitated to a considerable extent.

The starting point is the situation in which all the animals are in the first area A and, at a first point of time t1, the doors 1 and 2 are opened, the doors 3 and 4 are closed and the doors 5 and 6 are in the shown position. In the latter situation, the animals can go freely from the area A to the milk box 7 in order to be milked there. As long as there is no animal present in the milk box 7, the

entrance door 8 thereof is open. The exit door 9 of the milk box is only opened to allow an animal to leave the milk box and is closed immediately afterwards. When an animal has been milked, it will return of its own accord to the area A. The situation changes at a second point of time t2: while the door 1 remains open, the door 2 is closed and the door 3 is opened; the door 4 remains closed, the door 5 is brought in the non-shown position, while the door 6 is maintained in the shown position. Now the animals can go freely from the area A to the milk box 7 in order to be milked there and to be guided from there to the area B. When afterwards, at a third point of time t3, it appears that in the area A there are still animals which, obviously, have not been milked in the time t3 - t2, then these animals are driven, either by the farmer or by means of the movable fences 13 and 14, to the milk box 7, are milked and guided to the area B. As soon as the last animal has entered the milk box 7 from the area A and all the other animals are in the area B, the door 1 is closed, while the door 3 remains closed, the door 4 is opened, while the door 3 is kept open and the door 6 is brought in the non-shown position, while the door 5 is maintained in the non-shown position. Now, at a fourth point of time (t4), the animals can go freely from the area B to the milk box 7 in order to be milked there and return from there to the area B. The situation changes again at a fifth point of time t5: the door 2 is opened, while the door 1 is kept closed, the door 3 is closed, while the door 4 is kept open and the door 5 is brought in the shown position, while the door 6 is maintained in the non-shown position. Then the animals can go freely from the area B to the milk box 7 in order to be milked there and be guided from there to the area A. When then, at a sixth point of time t6, it appears that in the area B there are still animals which, obviously, have not been milked in the time t6 - t5, then these animals are again driven to the milk box, are milked and guided to the area A. Then, at a seventh point of time (t7), the doors 1 to 6 can be reset in their initial position, i.e. in their position prevailing at the point of time t1.

When the point of time t1 is chosen e.g. around eight o'clock in the morning, the point of time t4 around eight o'clock in the evening and the point of time t7 again around eight o'clock in the morning, then, twice per 24 hours, i.e. in the morning and in the evening, at the most a few animals will have to be driven from an area to the milk box in order to be milked. These animals will no longer have to be separated from the herd. The points of time t2 and t5 can be attuned to the size of the herd and will be somewhere between six and ten hours after the relevant points of time t1 and t4.

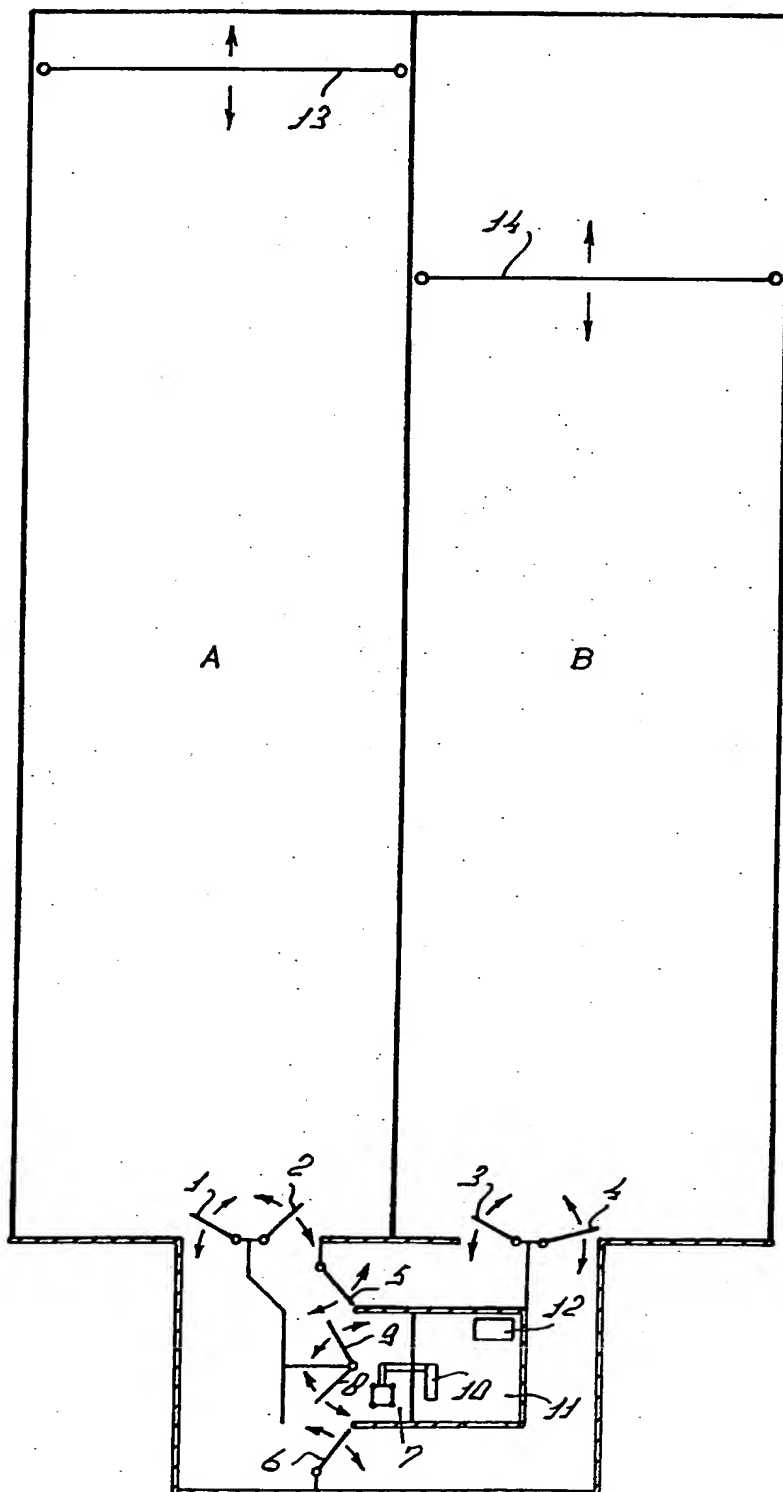
Claims

1. A method of milking animals, such as cows, in a milk box in which a milking robot is arranged, characterized in that a system of fences, gates, doors, or similar means is set up in such a way that from a

first point of time (t1) animals can go freely from a first area (A) to the milk box in order to be milked there and are guided back from there to the said area (A), that afterwards from a second point of time (t2) animals can go freely from the first area (A) to the milk box in order to be milked there and are guided from there to a second area (B) and that afterwards animals still being present in the first area (A) at a third point of time (t3) are driven to the milk box in order to be milked there and are guided from there to the second area (B).

2. A method as claimed in claim 1, characterized in that the system of fences, gates, doors, or similar means is set up in such a way that from the (fourth) point of time (t4) when the last animal has entered the milk box from the first area (A), animals from the second area (B) can go freely to the milk box in order to be milked there and are guided back from there to the said area (B), that afterwards from a fifth point of time (t5) animals from the second area (B) can go freely to the milk box in order to be milked there and are guided from there to the first area (A) and that then animals still being present in the second area (B) at a sixth point of time (t6) are driven to the milk box in order to be milked there and are guided from there to the first area (A).
3. A method as claimed in claim 2, characterized in that the cycle from the first point of time (t1) until the next first point of time (t7) the animals can go freely from the first area (A) to the milk box corresponds to approximately 24 hours.
4. A method as claimed in any one of the preceding claims, characterized in that the system of fences, gates, doors, or similar means is computer-controlled.
5. A method as claimed in any one of the preceding claims, characterized in that by means of a movable fencing the animals can be driven to a milk box.
6. A method as claimed in claim 5, characterized in that the movable fencing is computer-controlled.
7. A construction for milking animals, such as cows, comprising a milk box (7) with a milking robot (10), a computer (12), two separate areas (A, B) and a system of computer controlled fences, gates, doors, or similar means (1 - 6, 8, 9) via which both areas (A, B) can communicate with the milk box (7), in which construction the computer works such that the method according to any one of the claims 1 - 6 can be applied.
8. A construction as claimed in claim 7, characterized in that computer controlled drive means are provided to drive animals to the milk box (7).

9. A construction as claimed in claim 8, characterized in that the drive means are constituted by movable fencings (13, 14).
10. A construction as claimed in claim 8 or 9, characterized in that the drive means only drive animals to the milk box (7) which have not been milked during a defined time interval ($t_3 - t_1$, $t_7 - t_6$). 5
11. A construction as claimed in any one of the preceding claims, characterized in that the construction comprises a system whereby the cows are automatically milked and whereby the cows are driven to the automatic milking robot by electronic means. 10
12. A construction as claimed in any one of the preceding claims, characterized in that the construction comprises a system for selecting slow moving cows in an electronic way. 15
13. A construction as claimed in any one of the preceding claims, characterized in that the construction comprises movable means whereby the cows will go through the milking robot at adjustable points of time. 20
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EUROPEAN SEARCH REPORT

Application Number
EP 96 20 1820

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 566 201 A (C. VAN DER LELY) * column 4, line 29 - column 5, line 57; figure 1 * -----	1-13	A01K1/12
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A01K A01J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 8 October 1996	Examiner von Arx, V
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone V : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			

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